Editorial

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This issue of *Structures and Buildings* consists of five technical papers. Research investigations concerning high-strength steel butt welds, mid-connection in off-centre bracing system, welded box-section columns under eccentric compression, a review of research on high-strength steel structures and creep effects in a long-span concrete-filled steel tube arch bridge are covered.

The first paper by Sun *et al.* (2018) examines the structural response of high-strength steel butt weld with softened HAZ. Firstly, static tensile tests were conducted on 26 butt-welded joints on base steel of Q690 grade high-strength steel, which exhibits softening behaviour in the heat-affected zone (HAZ). Furthermore, a new method was proposed for calibrating the true stress–strain relationship based on a trial-and-error approach using simulation through comparing the load–deformation response for three materials (base metal, weld metal and HAZ) in a butt weld. Finally, the authors concluded that BS EN 1993-1-12 (BSI, 2007) couldn't be used directly to design a butt weld with a soft interlayer in the HAZ of high-strength steel.

In the second paper by Yazdi and Sulong (2018) the authors investigated the behaviour of mid-connections in an off-centre bracing system (OCB) based on a theoretical and experimental investigation. Two one-third scale frames with different eccentricities were considered using single angles sections for the brace elements. The authors assessed the lateral buckling load of the braced frame evaluating the stiffness matrix obtained from the slope-deflection method and equilibrium equation at the connection point. Furthermore, the authors concluded that the validation of the theoretical approach with finite element analysis showed a good agreement when compared to the experimental results.

The next paper by Yan *et al.* (2018) presents the experimental and numerical results of a set of Q460C steel welded box-section columns under eccentric compression. Seven specimens were tested with width-to-thickness ratio of 18, 12 and 8. Afterwards the calibration of the developed numerical model

in *Ansys*® software, an extensive parametric analysis was performed in order to extend the scope of the study and investigate the effects of slenderness, eccentric ratio and width-to-thickness ratio on the ultimate strength of eccentrically loaded columns. According to the authors, the current design interaction formulae are conservative for 460 MPa welded box-section columns in bending and axial compression. The ultimate strength is underestimated by 23 and 24% according to BS EN 1993-1-1 (CEN, 2005) and GB 50017-2003 (MOHURD, 2003), respectively.

In the fourth paper, Ban and Shi (2018) present a review of the research on high-strength steel (HSS) structures in the last years. According to the authors, the use of HSS offer numerous benefits in terms of mechanical performance, economy and sustainability. Regarding the increase of use of these structures experimental, numerical and theoretical investigations should be developed in order to better understand it's the global behaviour. The review presented by the authors considered different aspects such as material properties, the behaviour of component members and connections and the performance of frame structures. The authors, as expected, concluded that HSS structures exhibit new features in terms of mechanical performance when compared with conventional mild steel structures.

In the last paper, Zeng *et al.* (2018) investigated the creep effects in a long-span concrete-filled steel tube arch bridge based on experiments, theoretical analysis, finite element models and in situ measurements. First, a creep experiment of the arch-foot segment was carried out to investigate time dependent behaviours. Subsequently, two theoretical analysis methods were used to determine creep coefficients of the arch members. According to experimental results, the authors verified that the creep strains of the arch developed very rapidly at the start of loading but grew very slowly later. The authors also concluded from the in situ measured stress data that concrete stresses reduced and steel stresses, conversely, increased with time.

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